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Vernon Hills, Illinois 60061-1450
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24 April 2000

Mr. Mike Ribordy
Remedial Project Manager
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604

U.S. EPA Contract No.: 68-W7-0026
Work Assignment No.: 036-RICO-05MZ
Document Control No.: RFW036-2D-AFGP

Re: Health and Safety Plan
Evergreen Manor Site
Roscoe, Illinois

Dear Mr. Ribordy:

As requested, Roy F. Weston. Inc. (WESTON®) is pleased to submit two copies of the Health and Safety Plan (HASP) for the Evergreen Manor site for your use. If you have any questions, please call us at (847) 918-4000.

Very truly yours,

ROY F. WESTON, INC.

Kurt T. Fischer, P.G.
Site Manager

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SITE HEALTH AND SAFETY PLAN (HASP)

Prepared by:
Krista Richardson / Andris Slesers

W.O. Number: 20064-036-100 **Date:** 04/20/00

Project Identification
Office: 01554/VHI MW Division
Site Name: Evergreen Manor
Client: U.S. EPA
Work Location Address: The Evergeen Manor Site is located approximately 1.5 miles NW of the Village of Roscoe, IL, in the West half of Sections 21 and 29, the South half of Section 16, and the East half of Sections 20 and 30, Township 46 N, Range 2 East.

Site History:
A RI/FS will be conducted to select a remedy to eliminate, reduce, or control risks to human health and the environment. Contamination was originally discovered at the site in November 1990 when a local homeowner's private water supply was analyzed. Analysis of the well indicated high levels or VOCs. IEPA and IDPH sampled the drinking water wells at 267 location in and around the Evergreen Manor site between December 1990 and March 1994 and installed 20 monitoring wells upgradient of the site. In July of 1998, EPA announced that the Site was proposed for the Superfund NPL List.

Scope of Work:
Task 1: Soil Borings/Soil Sampling and Monitoring Well Installation
Task 2: Groundwater sampling Task 3: Residential/Monitoring well sampling Task 4: Surface water/Sediment sampling

☐ Site visit only; site HASP not necessary. List personnel here and sign off below:

Regulatory Status:

Site regulatory status:

CERCLA/SARA	RCRA	Other Federal Agency
☒ U.S. EPA	☐ U.S. EPA	☐ DOE
☐ State	☐ State	☐ USACE
☐ NPL Site	NRC	☐ Air Force
☐ OSHA	☐ 10 CFR 20	☐ _____

☐ Hazard Communication (Req'd See Attachment D)
☒ 1910 ☒ 1926 ☐ State

Safety Officer Manual (Required to be On-Site)
Based on the Hazard Assessment and Regulatory Status, determine the Standard HASP(s) applicable to this project. Indicate below which Standard HASP will be used and append the appropriate pages of this form along with the Standard Plan.

☐ Stack Test	☐ _____
☐ Air Emissions	☐ _____
☐ Asbestos	☐ _____
☐ Industrial Hygiene	☐ _____
☐ _____	☐ _____

Review and Approval Documentation:

Reviewed by:
SO/DSM/CHS — Robert Norris (Name (Print)) — Robert Norris (Signature) — Date: 4/21/00

Other — _____ (Name (Print)) — _____ (Signature) — Date: _____

Approved by:
Project Manager — Kurt Fischer (Name (Print)) — (Signature) — Date: 4/21/00

Hazard Assessment and Equipment Selection:

In accordance with WESTON's Personal Protective Equipment Program and 29 CFR 1910.132, at the site prior to personnel beginning work, the SHSC and/or the Site Manager have evaluated conditions and verified that the personal protective equipment selection outlined within this HASP is appropriate for the hazards known or expected to exist. (Refer to Safety Officer Manual Section 2, Personal Protection Program, for guidance.)

☒ SHSC ☐ Site Manager — ANDRIS J. SLESERS (Name (Print)) — (Signature) — Date: 4/21/00

Project start date:	This site HASP must be reissued/reapproved for any activities conducted after:	Amendment date(s) By:
End date:	Date: 11/30/00	1. 2. 3. 4.

WESTON REPRESENTATIVES

Organization/Branch	Name/Title	Address	Telephone
001154/MWD/VHI	Andris Slesers/ Hydrogeologist	3 Hawthorn Parkway, Suite 400 Vernon Hills, IL 60061	(847) 918-4012
001098/MWD/VHI	Kurt Fischer/PM	3 Hawthorn Parkway, Suite 400 Vernon Hills, IL 60061	(847) 918-4016
001154/MWD/VHI	Angela Strong/ Geologist	3 Hawthorn Parkway, Suite 400 Vernon Hills, IL 60061	(847) 918-4096

Roles and Responsibilities: Kurt Fischer is the Project Manager. Andris Slesers is the Field Team Leader. Angela Strong is an alternate Field Team Leader.

WESTON SUBCONTRACTORS

Organization/Branch	Name/Title	Address	Telephone
Fugro Geosciences, Inc.	Jeff Ness / Dennis Stauffer Operations Mangers	6105 Rookin Street Houston, Texas 77074	(713) 778-5580

Roles and Responsibilities: Fugro will provide personnel and equipment to complete all Cone Penetrometer Testing (CPT) work.

SITE-SPECIFIC HEALTH AND SAFETY PERSONNEL

The Site Health and Safety Coordinator (SHSC) for activities to be conducted at this site is: Andris Slesers

The SHSC has total responsibility for ensuring that the provisions of this Site HASP are adequate and implemented in the field.

Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, the personnel assigned as SHSCs are experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120.

Qualifications: Andris Slesers, and the alternate Angela Strong, are current in First Aid, CPR, Bloodborne Pathogens, OSHA 40 hour, OSHA 8 hour refresher, and SHSC Course.

Designated alternates include: Angela Strong

HEALTH AND SAFETY EVALUATION

Hazard Assessment

Background Review: ☒ Complete ☐ Partial If partial why?

Activities Covered Under This Plan:

No.	Task/Subtask	Description	Schedule
1	Soil boring/ Soil sampling/ Monitoring Well Installation	Soil borings will be advanced to specific depths. Soil samples will be collected using a split-spoon sampler. Monitoring wells will be installed in soil borings where applicable.	1 week
2	Groundwater sampling	Groundwater samples will be collected at 13 CPT test locations by advancing a stainless steel shielded well point and sample barrel or using an inertial pump.	2-3 weeks
3	Monitoring/ Residential well sampling	Residential and monitoring wells will be purged and sampled. Up to five monitoring wells may be installed at the site.	2-3 weeks
4	Surface water/Sediment sampling	Sediment and surface water samples will be collected from the Rock River and Dry Creek.	2-3 days

Types of Hazards:

1 Numbers refer to one of the following hazard evaluation forms. Complete hazard evaluation forms for each appropriate hazard class.

Physiochemical 1

- ☒ Flammable
- ☐ Explosive
- ☐ Corrosive
- ☐ Reactive
- ☐ O_2 Rich
- ☐ O_2 Deficient

Chemically Toxic 1

- ☒ Inhalation
- ☒ Ingestion
- ☒ Contact
- ☒ Absorption
- ☒ Carcinogen
- ☐ Mutagen
- ☐ Teratogen

- ☒ OSHA 1910.1000 Substance (Air Contaminants)
- ☒ OSHA Specific Hazard Substance Standard (Refer to following page for listing)

Radiation 3

Ionizing:

- ☐ Internal exposure
- ☐ External exposure

Non-ionizing:

- ☐ UV
- ☐ IR
- ☐ RF
- ☐ MicroW
- ☐ Laser

Biological 2

- ☐ Etiological Agent
- ☒ Other (plant, insect, animal)

- ☒ **Physical Hazards 4**
- ☐ Construction Activities

Source/Location of Contaminants and Hazardous Substances:

Directly Related to Tasks

- ☐ Air

Indirectly Related to Tasks — Nearby Process(es) That Could Affect Team Members:

- ☒ Client Facility/WESTON Work Location – On site laboratory.

☐ Other Surface ☒ Groundwater ☒ Soil ☒ Surface Water ☐ Sanitary Wastewater ☐ Process Wastewater ☐ Other _ _____ _____	☐ **Nearby Non-Client Facility** **Describe:** ☐ **Have activities** (task[s]) been coordinated with facility?

HEALTH AND SAFETY EVALUATION — 1 CHEMICAL HAZARDS OF CONCERN

☐ N/A

Chemical Contaminants of Concern

Provide the data requested for chemical contaminants on HASP Form 25 or attach data sheets from an acceptable source such as NIOSH pocket guide, condensed chemical dictionary, ACGIH TLV booklet, etc. List chemicals and concentrations below and locate data sheets in Attachment B of this HASP.

☐ N/A

Identify hazardous materials used or on-site and attach Material Safety Data Sheets (MSDSs) for all reagent type chemicals, solutions, or other identified materials that in normal use in performing tasks related to this project could produce hazardous substances. Ensure that all subcontractors and other parties working nearby are informed of the presence of these chemicals and the location of the MSDSs. Obtain from subcontractors and other parties, lists of the hazardous materials they use or have on-site and identify location of the MSDSs here. List chemicals and quantities below and locate MSDSs in Attachment B of this HASP.

Chemical Name	Concentration (if known)	Chemical Name	Quantity
1,1-dichloroethene	>7 ppb	Alconox	5-gallon diluted solution
cis-1,2-dichloroethene	unknown	Sulfuric Acid (as preservative) in sample bottles	small amounts
1,1-dichlorethane	unknown	Hydrochloric Acid (as preservative) in sample bottles	small amounts
1,1,1-trichloroethane (1,1,1-TCA)	unknown	Zinc Acetate (as preservative) in sample bottles	small amounts
TCE	>5 ppb	Sodium Hydroxide	small amounts
PCE	unknown	gasoline	Less than 5 gallons
1,1,2-trichloroethane	unknown		

OSHA-SPECIFIC HAZARDOUS SUBSTANCES

The following substances may require specific medical, training, or monitoring based on concentration or evaluation of risk. See the appropriate citation listed under 29 CFR 1910 or 1926 for additional information.

☐ 1910.1001 Asbestos	☐ 1910.1002 Coal tar pitch volatiles	☐ 1910.1003 4-Nitrobiphenyl, etc.	☐ 1910.1004 alpha-Naphthylamine
☐ 1910.1005 [Reserved]	☐ 1910.1006 Methyl chloromethyl ether	☐ 1910.1007 3,3'-Dichlorobenzidine (and its salts)	☐ 1910.1008 bis-Chloromethyl ether
☐ 1910.1009 beta-Naphthylamine	☐ 1910.1010 Benzidine	☐ 1910.1011 4-Aminodiphenyl	☐ 1910.1012 Ethyleneimine
☐ 1910.1013 beta-Propiolactone	☐ 1910.1014 2-Acetylaminofluorene	☐ 1910.1015 4-Dimethylaminoazobenzene	☐ 1910.1016 N-Nitrosodimethylamine
☐ 1910.1017 Vinyl chloride	☐ 1910.1018 Inorganic arsenic	☐ 1910.1025 Lead (Att. FLD# 46)	☐ 1910.1027 Cadmium
☐ 1910.1028 Benzene	☐ 1910.1029 Coke oven emissions	☐ 1910.1043 Cotton dust	☐ 1910.1044 1,2-Dibromo-3-chloropropane
☐ 1910.1045 Acrylonitrile	☐ 1910.1047 Ethylene oxide	☐ 1910.1048 Formaldehyde	☐ 1910.1050 Methylenedianiline
☐ 1910.1051 1,3 Butadiene	☐ 1910.1052 Methylene chloride		

HEALTH AND SAFETY EVALUATION — 2 BIOLOGICAL HAZARDS OF CONCERN

☒ **Poisonous Plants** (FLD 43)

Location/Task No(s).: 1-4

Source: ☐ Known ☒ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☒ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☒ Yes ☐ No

Immunization required: ☐ Yes ☒ No

☒ **Insects** (FLD 43)

Location/Task No(s).: 1-4

Source: ☐ Known ☒ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☒ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

☐ **Snakes, Reptiles** (FLD 43)

Location/Task No(s).:

Source: ☐ Known ☐ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No

Immunization required: ☐ Yes ☐ No

☒ **Animals** (FLD 43)

Location/Task No(s).: 1-4

Source: ☐ Known ☒ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☒ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☒ No

Immunization required: ☐ Yes ☒ No

FLD 43 — WESTON Biohazard Field Operating Procedures: Att. OP ☒

☐ **Sewage**

Location/Task No(s).:

Source: ☐ Known ☐ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No

Immunization required: ☐ Yes ☐ No

Tetanus Vaccination within Past 10 yrs: ☐ Yes ☐ No

☐ **Etiologic Agents (List)**

Location/Task No(s).:

Source: ☐ Known ☐ Suspect

Route of Exposure: ☐ Inhalation ☐ Ingestion ☐ Contact ☐ Direct Penetration

Team Member(s) Allergic: ☐ Yes ☐ No

Immunization required: ☐ Yes ☐ No

FLD 44 — WESTON Bloodborne Pathogens Exposure Control Plan – First Aid Procedures: Att. OP ☒

FLD 45 — WESTON Bloodborne Pathogens Exposure Control Plan – Working with Infectious Waste: Att. OP ☐

HEALTH AND SAFETY EVALUATION — 4 PHYSICAL HAZARDS OF CONCERN

Phy. Haz. Cond.	Physical Hazard	Attach OP	WESTON OP Titles
Loud noise	Hearing loss/disruption of communication	☒	FLD01 - Noise Protection
Inclement weather	Rain/humidity/cold/ice/snow/lightning	☒	FLD02 - Inclement Weather
Steam heat stress	Burns/displaced oxygen/wet working surfaces	☒	FLD03 - Hot Process - Steam
Heat stress	Burns/hot surfaces/low pressure steam	☐	FLD04 - Hot Process - LT3
Ambient heat stress	Heat rash/cramps/exhaustion/heat stroke	☒	FLD05 - Heat Stress Prevention/Monitoring
Cold stress	Hypothermia/frostbite	☒	FLD06 - Cold Stress
Cold/wet	Trench/paddy/immersion foot/edema	☒	FLD07 - Wet Feet
Confined spaces	Falls/burns/drowning/engulfment/electrocution	☐	FLD08 - Confined Space Entry
Explosive vapors	Thermal burns/impaction/dismemberment	☐	FLD09 - Hot Work
Improper lifting	Back strain/abdomen/arm/leg muscle/joint injury	☒	FLD10 - Manual Lifting/Handling Heavy Objects
Uneven surfaces	Vehicle accidents/slips/trips/falls	☒	FLD11 - Rough Terrain
Poor housekeeping	Slips/trips/falls/punctures/cuts/fires	☒	FLD12 - Housekeeping
Structural integrity	Crushing/overhead hazards/compromised floors	☐	FLD13 - Structural Integrity
Hostile persons	Bodily injury	☒	FLD14 - Site Security
Remote area	Slips/trips/falls/back strain/communication	☒	FLD15 - Remote Area
Improper cyl. handling	Mechanical injury/fire/explosion/suffocation	☐	FLD16 - Pressure Systems - Compressed Gases
Water hazards	Poor visibility/entanglement/drowning/cold stress	☐	FLD17 - Diving
Water hazards	Drowning/heat/cold stress/hypothermia/falls	☐	FLD18 - Operation and Use of Boats
Water hazards	Drowning/frostbite/hypothermia/falls/electrocution	☒	FLD19 - Working Over Water
Vehicle hazards	Struck by vehicle/collision	☒	FLD20 - Traffic
Explosions	Explosion/fire/thermal burns	☐	FLD21 - Explosives
Moving mechanical parts	Crushing/pinch points/overhead hazards/electrocution	☒	FLD22 - Heavy Equipment Operation
Moving mech. parts	Overhead hazards/electrocution	☐	FLD23 - Cranes/Lifting Equipment Operation
Working at elevation	Overhead hazards/falls/electrocution	☐	FLD24 - Aerial Lifts/Manlifts
Working at elevation	Overhead hazards/falls/electrocution	☐	FLD25 - Working at Elevation
Working at elevation	Overhead hazards/falls/electrocution/slips	☐	FLD26 - Ladders
Working at elevation	Slips/trips/falls/overhead hazards	☐	FLD27 - Scaffolding
Trench cave-in	Crushing/falling/overhead hazards/suffocation	☐	FLD28 - Excavating/Trenching
Improper material handling	Back injury/crushing from load shifts	☒	FLD29 - Materials Handling
Physiochemical	Explosions/fires from oxidizing, flam./corr. material	☒	FLD30 - Hazardous Materials Use/Storage
Physiochemical	Fire and explosion	☐	FLD31 - Fire Prevention/Response Plan Required
Physiochemical	Fire	☒	FLD32 - Fire Extinguishers Required
Structural integrity	Overhead/electrocution/slips/trips/falls/fire	☐	FLD33 - Demolition
Electrical	Electrocution/shock/thermal burns	☒	FLD34 - Utilities
Electrical	Electrocution/shock/thermal burns	☒	FLD35 - Electrical Safety
Burns/fires	Heat stress/fires/burns	☐	FLD36 - Welding/Cutting/Burning
Impact/thermal	Thermal burns/high pressure impaction/heat stress	☒	FLD37 - High Pressure Washers
Impaction/electrical	Smashing body parts/pinching/cuts/electrocution	☒	FLD38 - Hand and Power Tools
Poor visibility	Slips/trips/falls	☒	FLD39 – Illumination
Fire/explosion	Burns/impaction	☐	FLD40 - Storage Tank Removal/Decommissioning
Communications	Disruption of communications	☒	FLD41 - Std. Hand/Emergency Signals
Energy/release	Unexpected release of energy	☒	FLD42 - Lockout/Tagout
Drilling hazards	Electrocution/overhead hazards/pinch points	☒	2.5 - Drilling Safety Guide

TASK-BY-TASK RISK ASSESSMENT
(Complete One Sheet for Each Task)

TASK DESCRIPTION

Task 1 - Soil borings: Soil borings and sampling will be accomplished using hollow stem auger drilling with split spoon sampling. If significant clay units or impermeable layers are encountered, Shelby tube samples may be collected for vertical permeability. Monitoring wells may be installed in select soil borings.

Task 2 - Groundwater sampling: Up to ten groundwater samples will be collected from each of the 16 CPT test locations. The samples will be collected by advancing a stainless steel shielded well point to the desired depth. The shield will be opened to allow groundwater to enter. Groundwater samples may be collected using an inertial pump where more sample volume is required.

Task 3 - Residential/Monitoring well sampling: Up to 50 residential wells will be sampled. The water system must first be purged following the set procedures. Water samples will be collected from outside taps/spigots as close as possible to the pump. Up to 13 monitoring wells will be sampled. Monitoring wells will be purged and sampled using a submersible pump.

Task 4 - Surface water/Sediment sampling: Six surface water and sediment samples will be collected from the Rock River and Dry Creek. Sediment samples are obtained using a spring-loaded Eckman dredge, Ponar grab sampler, bucket auger or another suitable device attached to a rope. Sediment samples will be collected starting with the farthest downstream location. Surface water samples will be collected from the same locations as the sediment samples. Surface water samples will be collected within 5 feet of the shore and just below the water surface.

EQUIPMENT REQUIRED/USED
(Be specific, e.g., hand tools, heavy equipment, instruments, PPE)

Drill rig, steam cleaner, PID or OVA, modified level D PPE, hand tools, pump, various water meters, generator.

POTENTIAL HAZARDS/RISKS

Chemical

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

PPE will be used to reduce potential to contact with water and/or soil. Concentrations are expected to be low, based on past detections. PID or OVM will be used to conitnuously monitor breathing zone during initial CPT work.

Physical

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

Drill rig, traffic, slip/trip/fall, and weather related hazards/concerns will be minimized by adherence to SOPs.

Biological

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

Insects may be present due to proximity to water bodies. Animals are not expected to be of concern. Poisonous plants (e.g., poison ivy) are expected. General awareness/avoidance and required PPE should address the hazards. Also refer to FLD OP 43.

RADIOLOGICAL

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What justifies risk level?

LEVELS OF PROTECTION/JUSTIFICATION

Start work in each work area in modified level D PPE with continuous air monitoring. If vapor levels exceed action levels, work will be stopped to evaluate the need for higher level of PPE.

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED
FLD Ops per Form 7; use of buddy system in work area; traffic control procedures.

PERSONNEL PROTECTION PLAN

Engineering Controls
Describe Engineering Controls used as part of Personnel Protection Plan:

Task(s)	
1 & 3	Dust suppression as necessary.

Administrative Controls
Describe Administrative Controls used as part of Personnel Protection Plan:

Task(s)	
1 – 4	Distance will be maintained from drilling equipment whenever possible. Appropriate traffic signs and safety cones will be used where necessary. "Work zones" will be established to minimize risk to public.

Personal Protective Equipment
Action Levels for Changing Levels of Protection. Refer to HASP Form 13, Site Air Monitoring Program—Action Levels. Define Action Levels for up or down grade for each task:

Task(s)	
1 – 4	All sampling will be performed in Modified Level D protection. Inner/outer latex or Nitrile gloves and rubber booties will be required when in contact with potentially contaminated material. Air monitoring will be required when in contact with potentially contaminated material. Air monitoring will be performed with a PID or OVA.

DESCRIPTION OF LEVELS OF PROTECTION

Level D		Level D Modified	
Task(s):		**Task(s):** 1-4	
☐ Head		☒ Head	Hard hat around drill rig
☐ Eye and Face		☒ Eye and Face	Safety glasses
☐ Hearing		☒ Hearing	Ear plugs (as necessary)
☐ Arms and Legs Only		☐ Arms and Legs Only	
☐ Appropriate Work Uniform		☒ Whole Body	Work uniform. Tyvek to keep clean (as necessary).
☐ Hand - Gloves		☒ Apron	Orange safety vest (as necessary)
☐ Foot - Safety Boots		☒ Hand - Gloves	Latex/Nitrile gloves
☐ Fall Protection		☒ Gloves	Surgical Nitrile gloves
☐ Flotation		☐ Gloves	
☐ Other		☒ Foot - Safety Boots	Steel toe safety boots
		☒ Over Boots	Booties

DESCRIPTION OF LEVELS OF PROTECTION

Level C		Level B
Task(s):		**Task(s):**
☒ Head	Hard hat	☐ Head
☒ Eye and Face	Respirator	☐ Eye and Face
☒ Hearing	Ear plugs - as necessary	☐ Hearing
☐ Arms and Legs Only		☐ Arms and Legs Only
☒ Whole Body	Tyvek	☐ Whole Body
☒ Apron	Orange safety vest (as necessary)	☐ Apron
☒ Hand - Gloves		☐ Hand - Gloves
☒ Gloves	Latex gloves	☐ Gloves
☒ Gloves	Nitrile gloves	☐ Gloves
☒ Foot - Safety Boots		☐ Foot - Safety Boots
☒ Outer Boots	Booties	☐ Outer Boots
☐ Boots (Other)		☐ Boots (Other)
☐ Half Face		☐ SAR - Airline
☐ Cart./Canister		☐ SCBA
☒ Full Face	MSA (or equivalent)	☐ Comb. Airline/SCBA
☐ Cart./Canister	GMC-H (or equivalent)	☐ Cascade System
☐ PAPR		☐ Compressor
☐ Cart./Canister		☐ Fall Protection
☐ Type C		☐ Flotation
☐ Fall Protection		☐ Other
☐ Flotation		
☐ Other		

SITE OR PROJECT HAZARD MONITORING PROGRAM

Air Monitoring Instruments

Instrument Selection and Initial Check Record

Reporting Format: ☐ Field Notebook ☐ Field Data Sheets* ☐ Air Monitoring Log ☐ Trip Report ☐ Other

Instrument	Task No.(s)	Number Required	Number Received	Checked Upon Receipt	Comment	Initials
☐ CGI				☐		
☐ O_2				☐		
☐ CGI/O_2				☐		
☐ CGI/O_2/tox-PPM, H_2S,H_2S/CO				☐		
☐ RAD				☐		
☐ GM (Pancake)				☐		
☐ NaI (Micro R)				☐		
☐ ZnS (Alpha Scintillator)				☐		
☐ Other _____				☐		
☒ PID	1			☐		
☐ HNu 10.2				☐		
☐ HNu 11.7				☐		
☐ Photovac, TMA				☐		
☒ OVM	1			☐		
☐ Other _____				☐		
☐ FID				☐		
☐ Fox 128				☐		
☐ Heath, AID, Other				☐		
☐ RAM, Mini-RAM, Other _____				☐		
☐ Monitox				☐		
Specify: _____				☐		
☐ Personal Sampling				☐		
Specify: _____				☐		
☐ Bio-Aerosol Monitor				☐		
☐ Pump - MSA, Dräeger, Sensidyne				☐		
☐ Tubes/type: _____				☐		
☐ Tubes/type: _____				☐		
☐ Other _____				☐		

*Refer to Attachment E.

SITE OR PROJECT HAZARD MONITORING PROGRAM

Air Monitoring Instruments Calibration Record

Instrument, Mfg., Model, Equip. ID No.	Date	Time	Calib. Material	Calib. Method Mfg.'s	Other	Initial Setting and Reading	Final Setting and Reading	Calibrator's Initials

SITE AIR MONITORING PROGRAM

Action Levels

These Action Levels, if not defined by regulation, are some percent (usually 50%) of the applicable PEL/TLV/REL. That number must also be adjusted to account for instrument response factors.

	Tasks	Action Level		Action
☐ **Explosive atmosphere**		Ambient Air Concentration	Confined Space Concentration	
		<10% LEL	0 to 1% LEL	Work may continue. Consider toxicity potential.
		10 to 25% LEL	1 to 10% LEL	Work may continue. Increase monitoring frequency.
		>25% LEL	>10% LEL	Work must stop. Ventilate area before returning.
☐ **Oxygen**		Ambient Air Concentration	Confined Space Concentration	
		<19.5% O_2	<19.5% O_2	Leave area. Re-enter only with self-contained breathing apparatus.
		19.5% to 25% O_2	19.5% to 23.5% O_2	Work may continue. Investigate changes from 21%.
		>25% O_2	>23.5% O_2	Work must stop. Ventilate area before returning.
☐ **Radiation**		< 3 times background		Continue work.
		3 times background to < 1 mR/hour		Radiation above background levels (normally 0.01-0.02 mR/hr) signifies possible radiation source(s) present. Continue investigation with caution. Perform thorough monitoring. Consult with a Health Physicist.
		> 1 mrem/hour		Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of Health Physicist.
☒ **Organic gases and vapors**	1	0-10 units		Work in modified Level D
		> 10 units		Allow borehole (or area) to vent, if readings persist stop work.
		Note: if level C upgrade required, Level C SHSC must be on site before work can continue.		Re-evaluate.
☒ **Inorganic gases, vapors, and particulates**	1	If visible dust is present		Implement more stringent dust control procedures
		If visible dust cannot be controlled		Stop work and re-evaluate

CONTINGENCIES

Emergency Contacts and Phone Numbers

Agency	Contact	Phone Number
Local Medical Emergency Facility (LMF)	Beloit Memorial Hospital, Inc.	(608) 364-5011
WESTON Medical Emergency Contact	Continuum - Dr. Elyane Theriault	1-800-229-3674
WESTON Health and Safety	Corporate Health and Safety	(610) 701-3000
Fire Department	Dispatcher	911
Police Department	Dispatcher	911
On-Site Coordinator- SHSC	TBD	TBD
Client Site Contact	TBD	TBD
Site Telephone	Weston Vehicle	TBD
Nearest Telephone	Weston Vehicle	TBD

Local Medical Emergency Facility(s)

Name of Hospital: Beloit Memorial Hospital, Inc.

Address: 1969 W. Hart Rd. Beloit, Wisconsin 53511	**Phone No.:** (608) 364-5011
Name of Contact:	**Phone No.:** 911

Type of Service: ☐ Physical trauma only ☐ Chemical exposure only ☒ Physical trauma and chemical exposure ☒ Available 24 hours	**Route to Hospital (written detail):** **Follow SR-251 North. SR-251 N becomes SR-51 N.** **Turn Right onto SR-81** **Turn left onto Prairie Ave.** **Turn Right onto W. Hart Rd.**	**Travel time from site:** 20 min **Distance to hospital:** 9 miles **Name/no. of 24-hr ambulance service:** Local Service / **911**

Secondary or Specialty Service Provider

Name of Hospital:

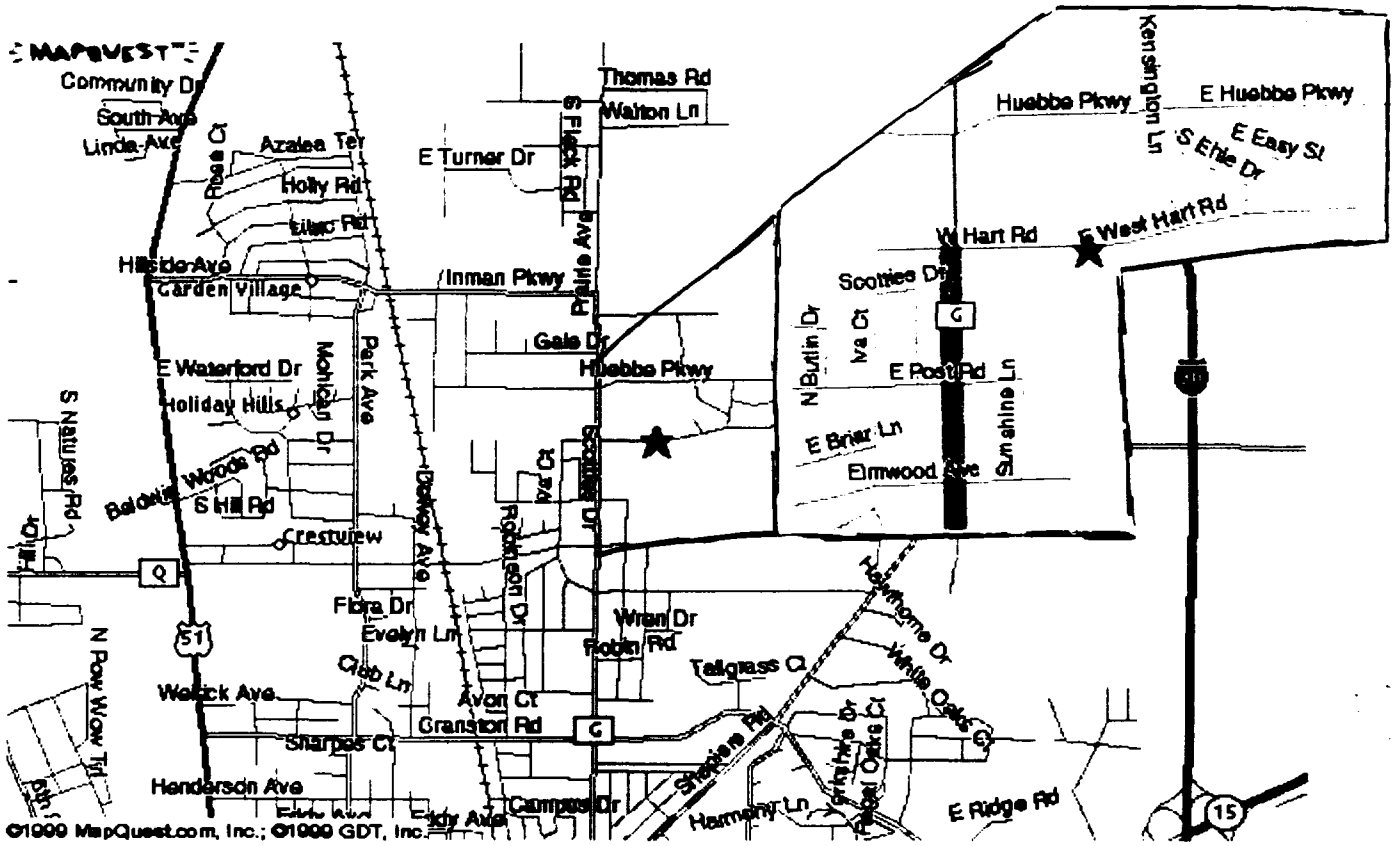
Address:	**Phone No.:**
Name of Contact:	**Phone No.:**

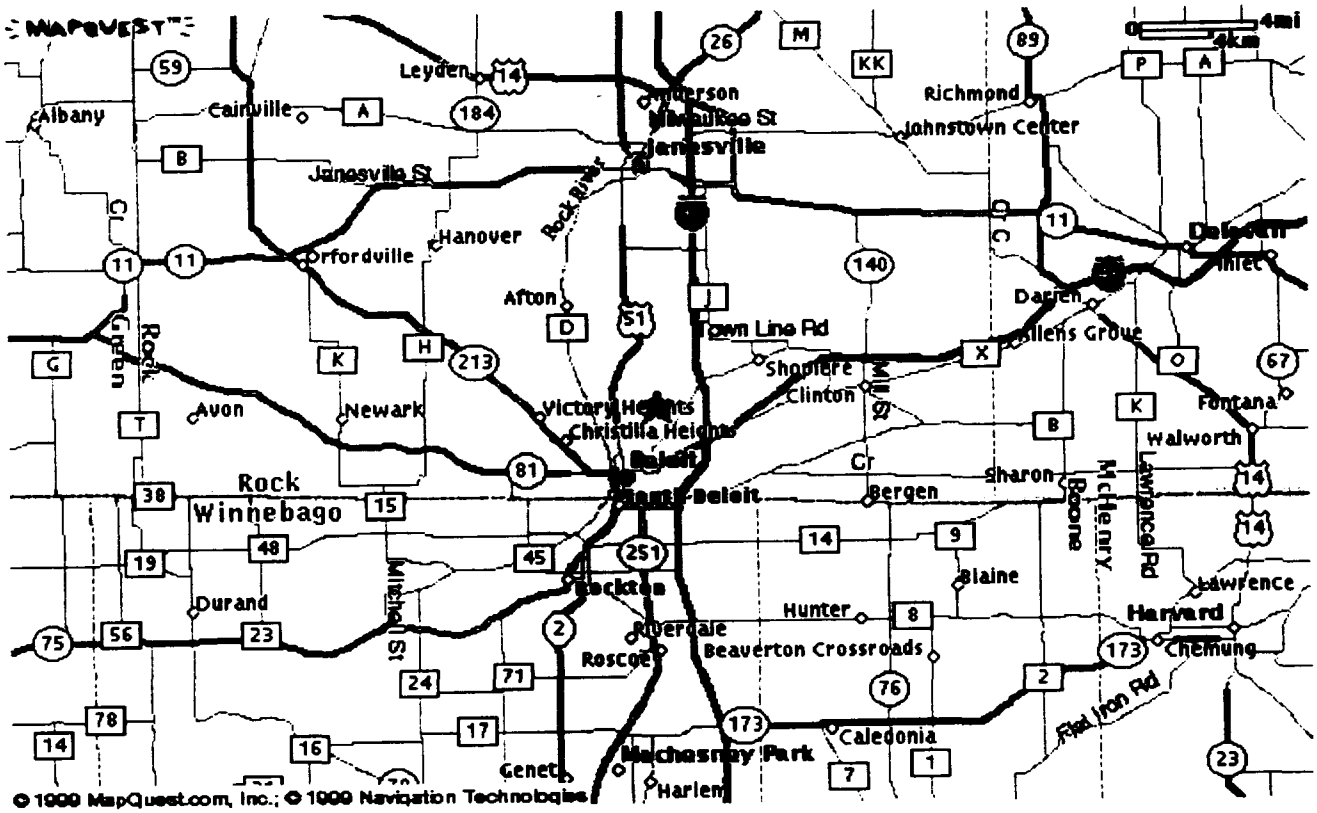
Type of Service: ☐ Physical trauma only ☐ Chemical exposure only ☐ Physical trauma and chemical exposure ☐ Available 24 hours	**Route to Hospital (written detail):**	**Travel time from site:** **Distance to hospital:** **Name/no. of 24-hr ambulance service:** /

Figure 1. Route to Hospital

(Draw map to hospital here if space permits or attach on next sheet.)

Beloit Memorial Hospital Inc
1969 W Hart Rd, Beloit, WI 53511
(608) 364-5011





CONTINGENCIES

Response Plans

Medical - General

Provide first aid, if trained; assess and determine need for further medical assistance.

Transport or arrange for transport after appropriate decontamination.

First Aid Kit:	Type	Location	Special First-Aid Procedures:
	Field kit	Weston	Cyanides on-site ☐ Yes ☒ No
	BBP kit	Vehicle	If yes, contact LMF. Do they have antidote kit? ☐ Yes ☐ No
Eyewash required ☒ Yes ☐ No	Type	Location: Weston; Vehicle	**HF** on-site ☐ Yes ☒ No. If yes, need neutralizing ointment for first-aid kit. Contact LMF.
Shower required ☐ Yes ☒ No	Type	Location	

Plan for Response to Spill/Release		**Plan for Response to Fire/Explosion**		**Fire Extinguishers**
In the event of a spill or release, ensure safety, assess situation, and perform containment and control measures, as appropriate.	a. Cleanup per MSDSs if small; or sound alarm, call for assistance, notify Emergency Coordinator b. Evacuate to pre-determined safe place c. Account for personnel d. Determine if team can respond safely e. Mobilize per Site Spill Response Plan	In the event of a fire or explosion, ensure personal safety, assess situation, and perform containment and control measures, as appropriate:	a. Sound alarm and call for assistance, notify Emergency Coordinator b. Evacuate to predetermined safe place c. Account for personnel d. Use fire extinguisher only if safe and trained in its use e. *Stand by to inform* emergency responders of materials and conditions	Type/Location ABC/Weston Vehicle ___/___ ___/___ ___/___ ___/___ ___/___ ___/___

Description of Spill Response Gear	Location	**Description** (Other Fire Response Equipment)	Location

Plan to Respond to Security Problems

Call police department @ 911.

DECONTAMINATION PLAN

Personnel Decontamination

Consistent with the levels of protection required, step-by-step procedures for personnel decontamination for each level of protection are attached.

Levels of Protection Required for Decontamination Personnel

The levels of protection required for personnel assisting with decontamination will be:

☐ Level B ☐ Level C ☒ Level D

Modifications include:

Disposition of Decontamination Wastes

Provide a description of waste disposition, including identification of storage area, hauler, and final disposal site, if applicable:

All waste material generated will be placed in appropriate containers and disposed of in accordance with all applicable regulations.

Equipment Decontamination

A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:

The CPT truck rig has a built in steam cleaning mechanism. All water generated during steam cleaning will be containerized in 55-gallon drums, or other sealable containers.

Should a drill rig be used, a temporary decontamination pad will be built; the working end of the drill rig will be steam cleaned; the augers and bits will be steam cleaned; and soil and/or water from steam cleaning will be collected in 55-gallon drums, or other sealable containers.

Sampling Equipment Decontamination

Sampling equipment will be decontaminated in accordance with the following procedure:

All sampling equipment will be steam cleaned or washed with an Alconox solution and rinsed with potable water.

LEVEL D/MODIFIED LEVEL D DECONTAMINATION PLAN

Check indicated functions or add steps, as necessary:

Function	Description of Process, Solution, and Container
☒ Segregated equipment drop	
☐ Boot cover and glove wash	
☐ Boot cover and glove rinse	
☐ Tape removal - outer glove and boot	
☒ Boot cover removal	Place in bag/drum
☒ Outer glove removal	Place inbag/drum
HOTLINE	
☐ Suit/safety boot wash	
☐ Suit/boot/glove rinse	
☐ Safety boot removal	
☒ Suit removal	As necessary - Place in bag/drum
☐ Inner glove wash	
☐ Inner glove rinse	
☒ Inner glove removal	Place in bag/drum
☐ Inner clothing removal	
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY	
☒ Field wash	Wash hands with soap and water.
☐ Redress	

Disposal Plan, End of Day:

All waste material generated will be placed in appropriate containers and disposed of in accordance with all applicable regulations.

Disposal Plan, End of Week:

As Above

Disposal Plan, End of Project:

As Above

LEVEL C DECONTAMINATION PLAN

Check indicated functions or add steps, as necessary:

Function	Description of Process, Solution, and Container
☒ Segregated equipment drop	
☐ Boot cover and glove wash	
☐ Boot cover and glove rinse	
☒ Tape removal - outer glove and boot	Place in bag/drum
☒ Boot cover removal	Place in bag/drum
☒ Outer glove removal	Place in bag/drum
HOTLINE	
☐ Suit/safety boot wash	
☐ Suit/boot/glove rinse	
☐ Safety boot removal	
☒ Suit removal	Place in bag/drum
☐ Inner glove wash	
☐ Inner glove rinse	
☒ Facepiece removal	Set aside for cleaning per SOPs
☒ Inner glove removal	Place in bag/drum
☐ Inner clothing removal	
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY	
☒ Field wash	Wash face and hands with soap and water.
☐ Redress	

Disposal Plan, End of Day:

All waste material generated will be placed in appropriate containers and disposed of per applicable regulatory requirements.

Disposal Plan, End of Week:

As Above

Disposal Plan, End of Project:

As Above

LEVEL B DECONTAMINATION PLAN

Check indicated functions or add steps, as necessary:

Function	Description of Process, Solution, and Container
☐ Segregated equipment drop	
☐ Boot cover and glove wash	
☐ Boot cover and glove rinse	
☐ Tape removal - outer glove and boot	
☐ Boot cover removal	
☐ Outer glove removal	
HOTLINE	
☐ Suit/safety boot wash	
☐ Suit/SCBA/boot/glove rinse	
☐ Safety boot removal	
☐ Remove SCBA backpack without disconnecting	
☐ Splash suit removal	
☐ Inner glove wash	
☐ Inner glove rinse	
☐ SCBA disconnect and facepiece removal	
☐ Inner glove removal	
☐ Inner clothing removal	
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY	
☐ Field wash	
☐ Redress	

Disposal Plan, End of Day:

Disposal Plan, End of Week:

Disposal Plan, End of Project:

SITE PERSONNEL AND CERTIFICATION STATUS

WESTON

Name: Andris Siesers **Title: Hydrogeologist** **Task(s): 1-4** **Certification Level or Description:** D-S ☒ Medical Current ☒ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name: Kurt Fischer** **Title: Project Manager** **Task(s): 1-4** **Certification Level or Description:** C-S ☒ Medical Current ☒ Training Current ☒ Fit Test Current (Qual.) ☒ Fit Test Current (Quant.)
Name: Angela Strong **Title: Associate Geologist** **Task(s): 1-4** **Certification Level or Description:** D-S ☒ Medical Current ☒ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s):** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)

TRAINING CURRENT - Training: All personnel, including visitors, entering the exclusion or contamination reduction zones must have certifications of completion of training in accordance with OSHA 29 CFR 1910, 29 CFR 1926, or 29 CFR 1910.120.

FIT TEST CURRENT - Respirator Fit Testing: All persons, including visitors, entering any area requiring the use or potential use of any negative pressure respirator must have had, as a minimum, a qualitative fit test, administered in accordance with OSHA 29 CFR 1910.134 or ANSI, within the last 12 months. If site conditions require the use of a full-face, negative-pressure, air-purifying respirator for protection from asbestos or lead, employees must have had a qualitative fit test, administered according to OSHA 29 CFR 1910.1001 or 1025/1926, within the last 6 months.

MEDICAL CURRENT - Medical Monitoring Requirements: All personnel, including visitors, entering the exclusion or contamination reduction zones must be certified as medically fit to work and to wear a respirator, if appropriate, in accordance with 29 CFR 1910, 29 CFR 1926/1910, or 29 CFR 1910.120.

The Site Health and Safety Coordinator is responsible for verifying all certifications and fit tests.

SITE PERSONNEL AND CERTIFICATION STATUS

Subcontractor's Health and Safety Program Evaluation

Name of Subcontractor: Fugro Geosciences, Inc.
Address: 6105 Rookin Street; Houston, Texas 77074

Activities To Be Conducted by Subcontractor: CPT work (Task 2 only). Task 1 subcontractor(s), if necessary are TBD.

Evaluation Criteria

Medical program meets OSHA/WESTON criteria ☒ Acceptable ☐ Unacceptable Comments:	Personal protective equipment available ☒ Acceptable ☐ Unacceptable Comments:	On-site monitoring equipment available, calibrated, and operated properly ☒ Acceptable ☐ Unacceptable Comments: To be provided by WESTON
Safe working procedures clearly specified ☒ Acceptable ☐ Unacceptable Comments:	Training meets OSHA/WESTON criteria ☒ Acceptable ☐ Unacceptable Comments: At least one worker per crew is 1st Aid/CPR trained.	Emergency procedures ☒ Acceptable ☐ Unacceptable Comments:
Decontamination procedures ☒ Acceptable ☐ Unacceptable Comments: To be determined by WESTON	General health and safety program evaluation ☒ Acceptable ☐ Unacceptable Comments:	Additional comments: ☒ Subcontractor has agreed to and will conform with the WESTON HASP for this project. ☐ Subcontractor will work under his own HASP, which has been accepted by project PM.

Evaluation Conducted by: Andris Slesers **Date: 4/20/00**

Subcontractor Personnel – To be determined prior to start

Name: **Title:** **Task(s): 2** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s): 2** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s): 2** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s): 2** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)
Name: **Title:** **Task(s): 2** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)	**Name:** **Title:** **Task(s): 2** **Certification Level or Description:** ☐ Medical Current ☐ Training Current ☐ Fit Test Current (Qual.) ☐ Fit Test Current (Quant.)

HEALTH AND SAFETY PLAN APPROVAL/SIGNOFF FORM

Site Name: Evergreen Manor Site	**WO#:** 20064-036-100
Address: Site is 1.5 miles northwest of the Village of Roscoe in Winnebago County, IL, in the west 1/2 of Sections 21 and 29, the south 1/2 of Section 16, and the East 1/2 of Sections 20 and 30, Township 46 North, Range 2 East.	
I understand, agree to, and will conform with the information set forth in this Health and Safety Plan (and attachments) and discussed in the personnel health and safety briefing(s).	

Name	Signature	Date
Andris Slesers		
Kurt Fischer		
Angela Strong		

TRAINING AND BRIEFING TOPICS

The following items will be covered at the site-specific training meeting, daily or periodically.

☒ Site characterization and analysis, Sec. 3.0, 29 CFR 1910.120 I	☐ Level A
☒ Physical hazards, HASP Form 07	☐ Level B
☒ Chemical hazards, HASP Form 04	☐ Level C
☒ Animal bites, stings, and poisonous plants	☒ Level D
☐ Etiologic (infectious) agents	☐ Monitoring, 29 CFR 1910.120 (h)
☒ Site control, 29 CFR 1910.120 d	☒ Decontamination, 29 CFR 1910.120 (k)
☒ Engineering controls and work practices, 29 CFR 1910.120 (g)	☒ Emergency response, 29 CFR 1910.120 (l)
☒ Heavy machinery	☒ Elements of an emergency response, 29 CFR 1910.120 (l)
☐ Forklift	☒ Procedures for handling site emergency incidents, 29 CFR 1910.120 (l)
☐ Backhoe	☐ Off-site emergency response, 29 CFR 1910.120 (l)
☒ Equipment	☐ Handling drums and containers, 29 CFR 1910.120 (j)
☒ Tools	☐ Opening drums and containers
☐ Ladder, 29 CFR 1910.27 (d)/29 CFR 1926	☐ Electrical material handling equipment
☒ Overhead and underground utilities	☐ Radioactive waste
☐ Scaffolds	☐ Shock-sensitive waste
☐ Structural integrity	☐ Laboratory waste packs
☐ Unguarded openings - wall, floor, ceilings	☐ Sampling drums and containers
☐ Pressurized air cylinders	☒ Shipping and transport, 49 CFR 172.101, IATA
☒ Personal protective equipment, 29 CFR 1910.120 (g); 29 CFR 1910.134	☐ Tank and vault procedures
☐ Respiratory protection, 29 CFR 1910.120 (g); ANSI Z88.2	☒ Illumination, 29 CFR 1910.120 (m)
☐	☒ Sanitation, 29 CFR 1910.120 (n)
☐	☐
☐	☐
☐	☐

ATTACHMENT A

CHEMICAL CONTAMINANTS DATA SHEETS

(Attach completed HASP Form 25
[H&S—1 Chemical Hazards Form]
or attach appropriate data sheets.)

NIOSH Pocket Guide to Chemical Hazards

1,1-Dichloroethane

CAS 75-34-3

$CHCl_2CH_3$

RTECS KI0175000

Synonyms & Trade Names
Asymmetrical dichloroethane; Ethylidene chloride; 1,1-Ethylidene dichloride

DOT ID & Guide
2362 130

Exposure Limits

NIOSH REL: TWA 100 ppm (400 mg/m^3) See Appendix C (Chloroethanes)

OSHA PEL: TWA 100 ppm (400 mg/m^3)

IDLH 3000 ppm See: 75343

Conversion 1 ppm = 4.05 mg/m^3

Physical Description
Colorless, oily liquid with a chloroform-like odor.

MW: 99.0	BP: 135°F	FRZ: -143°F	Sol: 0.6%
VP: 182 mmHg	IP: 11.06 eV		Sp.Gr: 1.18
Fl.P: 2°F	UEL: 11.4%	LEL: 5.4%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers, strong caustics

Measurement Method
Charcoal tube; CS_2; Gas chromatography/Flame ionization detection; IV [#1003, Halogenated Hydrocarbons]
See: NMAM INDEX

Personal Protection & Sanitation
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: N.R.

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA
Up to 1000 ppm: (APF = 10) Any supplied-air respirator
Up to 2500 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode
Up to 3000 ppm: (APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation skin; central nervous system depressant/depression; liver, kidney, lung damage

Target Organs Skin, liver, kidneys, lungs, central nervous system

See also: INTRODUCTION See ICSC CARD: 0249

NIOSH Pocket Guide to Chemical Hazards

1,2-Dichloroethylene	CAS 540-59-0
ClCH=CHCl	RTECS KV9360000
Synonyms & Trade Names Acetylene dichloride, cis-Acetylene dichloride, trans-Acetylene dichloride, sym-Dichloroethylene	**DOT ID & Guide** 1150 132P

Exposure Limits	NIOSH REL: TWA 200 ppm (790 mg/m^3)
	OSHA PEL: TWA 200 ppm (790 mg/m^3)

IDLH 1000 ppm See: 540590	**Conversion** 1 ppm = 3.97 mg/m^3

Physical Description
Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor.

MW: 97.0	BP: 118-140°F	FRZ: -57 to -115°F	Sol: 0.4%
VP: 180-265 mmHg	IP: 9.65 eV		Sp.Gr(77°F): 1.27
Fl.P: 36-39°F	UEL: 12.8%	LEL: 5.6%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers, strong alkalis, potassium hydroxide, copper [Note: Usually contains inhibitors to prevent polymerization.]

Measurement Method
Charcoal tube; CS_2; Gas chromatography/Flame ionization detection; IV [#1003, Halogenated Hydrocarbons]
See: NMAM INDEX

Personal Protection & Sanitation	**First Aid** (See procedures)
Skin: Prevent skin contact	Eye: Irrigate immediately
Eyes: Prevent eye contact	Skin: Soap wash promptly
Wash skin: When contaminated	Breathing: Respiratory support
Remove: When wet (flammable)	Swallow: Medical attention immediately
Change: N.R.	

Respirator Recommendations NIOSH/OSHA
Up to 2000 ppm: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode[£]/(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)[£]/(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, respiratory system; central nervous system depressant/depression

Target Organs Eyes, respiratory system, central nervous system
See also: INTRODUCTION See ICSC CARD: 0436

NIOSH Pocket Guide to Chemical Hazards

Vinylidene chloride	**CAS** 75-35-4
$CH_2=CCl_2$	**RTECS** KV9275000
Synonyms & Trade Names 1,1-DCE; 1,1-Dichloroethene; 1,1-Dichloroethylene; VDC; Vinylidene chloride monomer; Vinylidene dichloride	**DOT ID & Guide** 1303 129P (inhibited)

Exposure Limits	NIOSH REL: Ca See Appendix A
	OSHA PEL†: none

IDLH Ca [N.D.] See: IDLH INDEX	**Conversion**

Physical Description
Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.

MW: 96.9	BP: 89°F	FRZ: -189°F	Sol: 0.04%
VP: 500 mmHg	IP: 10.00 eV		Sp.Gr: 1.21
Fl.P: -2°F	UEL: 15.5%	LEL: 6.5%	

Class IA Flammable Liquid: Fl.P. below 73°F and BP below 100°F.

Incompatibilities & Reactivities
Aluminum, sunlight, air, copper, heat [Note: Polymerization may occur if exposed to oxidizers, chlorosulfonic acid, nitric acid, or oleum. Inhibitors such as the monomethyl ether of hydroquinone are added to prevent polymerization.]

Measurement Method
Charcoal tube; CS_2; Gas chromatography/Flame ionization detection; IV [#1015] See: NMAM INDEX

Personal Protection & Sanitation	**First Aid** (See procedures)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet (flammable) Change: N.R. Provide: Eyewash, Quick drench	Eye: Irrigate immediately Skin: Soap flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney dysfunction; pneumonitis; [Potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver & kidney tumors]

See also: INTRODUCTION See ICSC CARD: 0083

NIOSH Pocket Guide to Chemical Hazards

1,1,2-Trichloroethane	CAS 79-00-5
$CHCl_2CH_2Cl$	RTECS KJ3150000
Synonyms & Trade Names Ethane trichloride, beta-Trichloroethane, Vinyl trichloride	**DOT ID & Guide**

Exposure Limits	NIOSH REL: Ca TWA 10 ppm (45 mg/m^3) [skin] See Appendix A See Appendix C (Chloroethanes)
	OSHA PEL: TWA 10 ppm (45 mg/m^3) [skin]

IDLH Ca [100 ppm] See: 79005	**Conversion** 1 ppm = 5.46 mg/m^3

Physical Description
Colorless liquid with a sweet, chloroform-like odor.

MW: 133.4	BP: 237°F	FRZ: -34°F	Sol: 0.4%
VP: 19 mmHg	IP: 11.00 eV		Sp.Gr: 1.44
Fl.P: ?	UEL: 15.5%	LEL: 6%	

Combustible Liquid, forms dense soot.

Incompatibilities & Reactivities
Strong oxidizers & caustics; chemically-active metals (such as aluminum, magnesium powders, sodium & potassium)

Measurement Method
Charcoal tube; CS_2; Gas chromatography/Flame ionization detection; IV [#1003, Halogenated Hydrocarbons]
See: NMAM INDEX

Personal Protection & Sanitation	**First Aid** (See procedures)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: N.R. Provide: Eyewash, Quick drench	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, nose; central nervous system depressant/depression; liver, kidney damage; dermatitis; [Potential occupational carcinogen]

Target Organs Eyes, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver cancer]

See also: INTRODUCTION See ICSC CARD: 0080 See MEDICAL TESTS: 0235

NIOSH Pocket Guide to Chemical Hazards

Methyl chloroform	**CAS** 71-55-6
CH_3CCl_3	**RTECS** KJ2975000
Synonyms & Trade Names Chlorothene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)	**DOT ID & Guide** 2831 160

Exposure Limits	NIOSH REL: C 350 ppm (1900 mg/m^3) [15-minute] See Appendix C (Chloroethanes)
	OSHA PEL†: TWA 350 ppm (1900 mg/m^3)

IDLH 700 ppm See: 71556	**Conversion** 1 ppm = 5.46 mg/m^3

Physical Description
Colorless liquid with a mild, chloroform-like odor.

W: 133.4	BP: 165°F	FRZ: -23°F	Sol: 0.4%
VP: 100 mmHg	IP: 11.00 eV		Sp.Gr: 1.34
Fl.P: ?	UEL: 12.5%	LEL: 7.5%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities
Strong caustics; strong oxidizers; chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium; water [Note: Reacts slowly with water to form hydrochloric acid.]

Measurement Method
Charcoal tube; CS_2; Gas chromatography/Flame ionization detection; IV [#1003, Halogenated Hydrocarbons]
See: NMAM INDEX

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: N.R.	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA
Up to 700 ppm: (APF = 10) Any supplied-air respirator*/(APF = 50) Any self-contained breathing apparatus with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depressant/depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage

Target Organs Eyes, skin, central nervous system, cardiovascular system, liver

See also: INTRODUCTION See ICSC CARD: 0079 See MEDICAL TESTS: 0141

NIOSH Pocket Guide to Chemical Hazards

Tetrachloroethylene	**CAS** 127-18-4
$Cl_2C=CCl_2$	**RTECS** KX3850000
Synonyms & Trade Names Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene	**DOT ID & Guide** 1897 160

Exposure Limits	NIOSH REL: Ca **Minimize** workplace exposure concentrations. See Appendix A
	OSHA PEL†: TWA **100 ppm** C 200 ppm 300 ppm (5-minute maximum peak in any 3-hours)

IDLH Ca [150 ppm] See: 127184	**Conversion** 1 ppm = 6.78 mg/m^3

Physical Description
Colorless liquid with a mild, chloroform-like odor.

MW: 165.8	BP: 250°F	FRZ: -2°F	Sol: 0.02%
VP: 14 mmHg	IP: 9.32 eV		Sp.Gr: 1.62
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities
Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

Measurement Method
Charcoal tube; CS_2; Gas chromatography/Flame ionization detection; IV [#1003, Halogenated Hydrocarbons]
See: NMAM INDEX

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: N.R. Provide: Eyewash, Quick drench	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; vertigo (an illusion of movement), dizziness, incoordination; headache, somnolence (sleepiness, unnatural drowsiness); skin erythema (skin redness); liver damage; [Potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, liver, kidneys, central nervous system

Cancer Site [in animals: liver tumors]

See also: INTRODUCTION See ICSC CARD: 0076 See MEDICAL TESTS: 0179

NIOSH Pocket Guide to Chemical Hazards

Trichloroethylene	**CAS** 79-01-6
$ClCH=CCl_2$	**RTECS** KX4550000
Synonyms & Trade Names Ethylene trichloride, TCE, Trichloroethene, Trilene	**DOT ID & Guide** 1710 160

Exposure Limits	NIOSH REL: Ca See Appendix A See Appendix C
	OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)

IDLH Ca [1000 ppm] See: 79016	**Conversion** 1 ppm = 5.37 mg/m^3

Physical Description
Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW: 131.4	BP: 189°F	FRZ: -99°F	Sol(77°F): 0.1%
?: 58 mmHg	IP: 9.45 eV		Sp.Gr: 1.46
Fl.P: ?	UEL(77°F): 10.5%	LEL(77°F): 8%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities
Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

Measurement Method
Charcoal tube; CS_2; Gas chromatography/Flame ionization detection; IV [#1022] See: NMAM INDEX

Personal Protection & Sanitation	**First Aid** (See procedures)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: N.R. ovide: Eyewash, Quick drench	Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; headache, vertigo (an illusion of movement); visual disturbance, fatigue, giddiness, tremor, somnolence (sleepiness, unnatural drowsiness), nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [Potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

Cancer Site [in animals: liver & kidney cancer]

See also: INTRODUCTION See ICSC CARD: 0081 See MEDICAL TESTS: 0236

ATTACHMENT B

MATERIAL SAFETY DATA SHEETS

(MSDSs)

NIOSH Pocket Guide to Chemical Hazards

Gasoline

CAS 8006-61-9

RTECS LX3300000

Synonyms & Trade Names
Motor fuel, Motor spirits, Natural gasoline, Petrol [Note: A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics).]

DOT ID & Guide
1203 128

Exposure Limits

NIOSH REL: Ca See Appendix A

OSHA PEL†: none

IDLH Ca [N.D.] See: IDLH INDEX

Conversion 1 ppm 2.95 mg/m^3 (approx)

Physical Description
Clear liquid with a characteristic odor.

MW: 72 (approx)	BP: 102°F	FRZ: ?	Sol: Insoluble
VP: 38-300 mmHg	IP: ?		Sp.Gr(60°F): 0.72-0.76
Fl.P: -45°F	UEL: 7.6%	LEL: 1.4%	

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities
Strong oxidizers such as peroxides, nitric acid & perchlorates

Measurement Method
None available See: NMAM INDEX

Personal Protection & Sanitation
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: N.R.
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; dermatitis; headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonia (aspiration liquid); possible liver, kidney damage; [Potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver & kidney cancer]

See also: INTRODUCTION

NIOSH Pocket Guide to Chemical Hazards

Sodium hydroxide	**CAS** 1310-73-2
NaOH	**RTECS** WB4900000
Synonyms & Trade Names Caustic soda, Lye, Soda lye, Sodium hydrate	**DOT ID & Guide** 1823 154 (dry, solid) 1824 154 (solution)

Exposure Limits	NIOSH REL: C 2 mg/m^3
	OSHA PEL†: TWA 2 mg/m^3

IDLH 10 mg/m^3 See: 1310732	**Conversion**

Physical Description
Colorless to white, odorless solid (flakes, beads, granular form).

MW: 40.0	BP: 2534°F	MLT: 605°F	Sol: 111%
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 2.13
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid, but when in contact with water may generate sufficient heat to ignite combustible materials.

Incompatibilities & Reactivities
Water; acids; flammable liquids; organic halogens; metals such as aluminum, tin & zinc; nitromethane [Note: Corrosive to metals.]

Measurement Method
Filter; Hydrochloric acid; Titration; IV [#7401, Alkaline Dusts] See: NMAM INDEX

Personal Protection & Sanitation Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: Daily Provide: Eyewash, Quick drench	**First Aid** (See procedures) Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA
Up to 10 mg/m^3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode[£]/(APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/(APF = 25) Any powered, air-purifying respirator with a dust and mist filter[£]/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; pneumonitis; eye, skin burns; temporary loss of hair

Target Organs Eyes, skin, respiratory system

See also: INTRODUCTION See ICSC CARD: 0360 See MEDICAL TESTS: 0210

NIOSH Pocket Guide to Chemical Hazards

Sulfuric acid	**CAS** 7664-93-9
H_2SO_4	**RTECS** WS5600000
Synonyms & Trade Names Battery acid, Hydrogen sulfate, Oil of vitriol, Sulfuric acid (aqueous)	**DOT ID & Guide** 1830 137 1831 137 (fuming) 1832 137 (spent)

Exposure Limits	NIOSH REL: TWA 1 mg/m^3
	OSHA PEL: TWA 1 mg/m^3
IDLH 15 mg/m^3 See: 7664939	**Conversion**

Physical Description
Colorless to dark-brown, oily, odorless liquid. [Note: Pure compound is a solid below 51°F. Often used in an aqueous solution.]

MW: 98.1	BP: 554°F	FRZ: 51°F	Sol: Miscible
VP: 0.001 mmHg	IP: ?		Sp.Gr: 1.84 (96-98% acid)
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Liquid, but capable of igniting finely divided combustible materials.

Incompatibilities & Reactivities
Organic materials, chlorates, carbides, fulminates, water, powdered metals [Note: Reacts violently with water with evolution of heat. Corrosive to metals.]

Measurement Method
Si gel*; $NaHCO_3/Na_2CO_3$; Ion chromatography; IV [#7903, Inorganic Acids] See: NMAM INDEX

Personal Protection & Sanitation	**First Aid** (See procedures)
Skin: Prevent skin contact Eyes: Prevent eye contact Wash skin: When contaminated Remove: When wet or contaminated Change: N.R. Provide: Eyewash (>1%), Quick drench (>1%)	Eye: Irrigate immediately Skin: Water flush immediately Breathing: Respiratory support Swallow: Medical attention immediately

Respirator Recommendations NIOSH/OSHA
Up to 15 mg/m^3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode$^£$/(APF = 25) Any powered, air-purifying respirator with acid gas cartridge(s) in combination with a high-efficiency particulate filter$^£$
(APF = 50) Any chemical cartridge respirator with a full facepiece and acid gas cartridge(s) in combination with a high-efficiency particulate filter/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having a high-efficiency particulate filter/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-

mounted acid gas canister having a high-efficiency particulate filter/Any appropriate escape-type, self-contained breathing apparatus
Exposure Routes inhalation, ingestion, skin and/or eye contact
Symptoms irritation eyes, skin, nose, throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatis; dental erosion; tracheobronchitis; eye, skin burns; dermatitis
Target Organs Eyes, skin, respiratory system, teeth
See also: INTRODUCTION See ICSC CARD: 0362 See MEDICAL TESTS: 0218

NIOSH Pocket Guide to Chemical Hazards

Hydrogen chloride

CAS 7647-01-0

HCl

RTECS MW4025000

Synonyms & Trade Names
Anhydrous hydrogen chloride; Aqueous hydrogen chloride (i.e., Hydrochloric acid, Muriatic acid) [Note: Often used in an aqueous solution.]

DOT ID & Guide
1050 125 (anhydrous)
1789 157 (solution)

Exposure Limits

NIOSH REL: C 5 ppm (7 mg/m^3)

OSHA PEL: C 5 ppm (7 mg/m^3)

IDLH 50 ppm See: 7647010

Conversion 1 ppm = 1.49 mg/m^3

Physical Description
Colorless to slightly yellow gas with a pungent, irritating odor. [Note: Shipped as a liquefied compressed gas.]

MW: 36.5	BP: -121°F	FRZ: -174°F	Sol(86°F): 67%
VP: 40.5 atm	IP: 12.74 eV	RGasD: 1.27	
Fl.P: NA	UEL: NA	LEL: NA	

Nonflammable Gas

Incompatibilities & Reactivities
Hydroxides, amines, alkalis, copper, brass, zinc [Note: Hydrochloric acid is highly corrosive to most metals.]

Measurement Method
Si gel; $NaHCO_3/Na_2CO_3$; Ion chromatography; IV [#7903, Inorganic Acids] See: NMAM INDEX

Personal Protection & Sanitation
Skin: Prevent skin contact (solution)/Frostbite
Eyes: Prevent eye contact/Frostbite
Wash skin: When contaminated (solution)
Remove: When wet or contaminated (solution)
Change: N.R.
ovide: Eyewash (solution), Quick drench (solution), Frostbite

First Aid (See procedures)
Eye: Irrigate immediately (solution)/Frostbite
Skin: Water flush immediately (solution)/Frostbite
Breathing: Respiratory support
Swallow: Medical attention immediately (solution)

Respirator Recommendations NIOSH/OSHA
Up to 50 ppm: (APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern*/(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern/(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern*/(APF = 10) Any supplied-air respirator*/(APF = 50) Any self-contained breathing apparatus with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation, ingestion (solution), skin and/or eye contact

Symptoms irritation nose, throat, larynx; cough, choking; dermatitis; solution: eye, skin burns; liquid: frostbite; in animals: laryngeal spasm; pulmonary edema

Target Organs Eyes, skin, respiratory system
See also: INTRODUCTION See ICSC CARD: 0163 See MEDICAL TESTS: 0116

ATTACHMENT C

SAFETY PROCEDURES/FIELD OPERATING PROCEDURES

(FLD OPs)

* SEE SAFETY OFFICERS FIELD MANUAL

ATTACHMENT D

SITE-SPECIFIC HAZARD COMMUNICATION PROGRAM

SITE-SPECIFIC HAZARD COMMUNICATION PROGRAM

Location-Specific Hazard Communication Program/Checklist

To ensure an understanding of and compliance with the Hazard Communication Standard, WESTON will use this checklist/document (or similar document) in conjunction with the WESTON Written Hazard Communication Program as a means of meeting site- or location-specific requirements.

While responsibility for activities within this document reference the WESTON Safety Officer (SO), it is the responsibility of all personnel to effect compliance. Responsibilities under various conditions can be found within the WESTON Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by WESTON are known by all affected employees, the following Hazard Communication Program has been established. All affected personnel will participate in the Hazard Communication Program. This written program, as well as WESTON's Corporate Hazard Communication Program, will be available for review by any employee, employee representative, representative of OSHA, NIOSH, or any affected employer/employee on a multi-employer site.

☒ Site or other location name/address: Evergreen Manor / Roscoe, IL

☒ Site/Project/Location Manager: Kurt Fischer

☒ Site/Location Safety Officer: Andris Slesers

☒ List of chemicals compiled, format: ☒ HASP ☐ Other: _____

☒ Location of MSDS files: HASP

*** Items below to be completed at site.**

☐ Training conducted by: Name: _____ Date: _____

☐ Indicate format of training documentation: ☒ Field Log: ☐ Other: _____

☐ Client briefing conducted regarding hazard communication: _____

☐ If multi-employer site (client, subcontractor, agency, etc.), indicate name of affected companies:

_____

☐ Other employer(s) notified of chemicals, labeling, and MSDS information: _____

☐ Has WESTON been notified of other employer's or client's hazard communication program(s), as necessary? ☐ Yes ☐ No

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON personnel must be prepared and attached to this document or placed in a centrally identified location with the MSDSs. Further information on each chemical may be obtained by reviewing the appropriate MSDS. The list will be arranged to enable cross-reference with the MSDS file and the label on the container. The SO or Location Manager is responsible for ensuring the chemical listing remains up-to-date.

Container Labeling

The WESTON SO will verify that all containers received from the chemical manufacturer, importer, or distributor for use on-site are clearly labeled.

The SO is responsible for ensuring that labels are placed where required and for comparing MSDSs and other information with label information to ensure correctness.

Material Safety Data Sheets (MSDSs)

The SO is responsible for establishing and monitoring WESTON's MSDS program for the location. The SO will ensure that procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. He/she will see that any new information is passed on to the affected employees. If an MSDS is not received at the time of initial shipment, the SO will call the manufacturer and have an MSDS delivered for that product in accordance with the requirements of WESTON's Written Hazard Communication Program.

A log for, and copies of, MSDSs for all hazardous chemicals in use will be kept in the MSDS folder at a location known to all site workers. MSDSs will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON SO or the designated alternate. When a revised MSDS is received, the SO will immediately replace the old MSDS.

Employee Training and Information

The SO is responsible for the WESTON site-specific personnel training program. The SO will ensure that all program elements specified below are supplied to all affected employees.

At the time of initial assignment for employees to the work site, or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below.

- Hazardous chemicals present at the work site.
- Physical and health risks of the hazardous chemicals.
- The signs and symptoms of overexposure.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the MSDS file and Written Hazard Communication Program.
- How to determine the presence or release of hazardous chemicals in the employee's work area.
- How to read labels and review MSDSs to obtain hazard information.
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals.
- How to reduce or prevent exposure to hazardous chemicals through the use of controls procedures, work practices, and personal protective equipment.
- Hazardous, nonroutine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

Hazardous Nonroutine Tasks

When employees are required to perform hazardous nonroutine tasks, the affected employee(s) will be given information by the SO about the hazardous chemicals he or she may use during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps WESTON is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee, and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities may be performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee will contact the SO, at which time information as to the chemical(s) in the pipes, potential hazards of the chemicals or the process involved, and the safety precautions that should be taken will be determined and presented.

Multi-Employer Work Sites

It is the responsibility of the SO to provide other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. It is also the responsibility of the SO and the Site Manager to obtain information about hazardous chemicals used by other employers to which WESTON employees may be exposed. WESTON's chemical listing will be made available to other employers, as requested. MSDSs will be available for viewing, as necessary.

The location, format, and/or procedures for accessing MSDS information must be relayed to affected employees.

ATTACHMENT E

AIR SAMPLING PROGRAM DATA SHEETS

SITE AIR MONITORING PROGRAM

Field Data Sheets

Location:

% LEL	% O_2	PID (units)	FID (units)	Aerosol Monitor (mg/m^3)	GM: Shield Probe/ Thin Window		NaI (uR/hr)	ZnS (cpm)
					mR/hr	cpm		
Monitox (ppm)				Detector Tube(s)				
Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other

Location:

% LEL	% O_2	PID (units)	FID (units)	Aerosol Monitor (mg/m^3)	GM: Shield Probe/ Thin Window		NaI (uR/hr)	ZnS (cpm)
					mR/hr	cpm		
Monitox (ppm)				Detector Tube(s)				
Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other

AIR MONITORING/SAMPLING DATA LOG

Client:	**W.O. No.:**	**Sample No.:**
Address:	**Sampled By:**	**Date:**

Employee and Location Information

Employee Name:	**Employee No.:**	**Job Title:**

Respirator ☐ APR ☐ ½ Mask ☐ Full Face ☐ PAPR ☐ ½ Mask ☐ Full Face ☐ Hood ☐ SAR ☐ ½ Mask ☐ Full Face ☐ Hood ☐ SCBA	**Manufacturer:**	**Cartridge Type:**

PPE: ☐ Hard Hat ☐ HPD ☐ Gloves ☐ Safety Shoes ☐ Coveralls ☐ Other:

Sampling Data

Sampling Type: ☐ Personal ☐ TWA ☐ STEL ☐ Area ☐ Source ☐ Full Shift ☐ Partial Shift ☐ Grab	**Media:**	**Pump Type/Serial No.:** /
Calibrator/Serial No.: /	**Pre-Calibration:** 1. 2. 3. **avg-pre:**	**Post-Calibration:** 1. 2. 3. **avg-post:**

Start Time:	**Restart Time:**	**Restart Time:**	**Avg. Flowrate:**	**% Change:**
1st Stop Time:	**2nd Stop Time:**	**3rd Stop Time:**	**Total Time:**	**Volume:**

Multiple Samples for this TWA: ☐ Yes ☐ No	**Multiple Chemical Exposures:** ☐ Yes ☐ No	**Exposure Time:** ☐ Normal ☐ Worst Case

Sampling Conditions

Weather Conditions: Temp: R.H: B.P.: Other:

Engineering Controls:

Substances Evaluated

Substance	Result	Substance	Result	Substance	Result

Observations and Comments

QA by: **Date:**

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MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ZINC ACETATE

MSDS Number: Z1140 --- *Effective Date: 11/17/99*

1. Product Identification

Synonyms: Acetic acid, zinc salt, dihydrate; zinc diacetate; zinc acetate dihydrate
CAS No.: 557-34-6 (Anhydrous)
Molecular Weight: 219.50
Chemical Formula: (CH3COO)2Zn 2H2O
Product Codes:
J.T. Baker: 4296, 4297, 4304, 5658
Mallinckrodt: 8740

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Zinc Acetate	557-34-6	98 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None

Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
Ingestion:
Irritation of the mucous membranes due to hydrolysis and formation of acid in the stomach can occur. Large amounts can produce stomach cramps, stricture of the esophagus, nausea, and vomiting.
Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain.
Eye Contact:
Causes irritation, redness, and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or impaired respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices* , most recent edition, for details.
Personal Respirators (NIOSH Approved):
For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
White crystals or powder.
Odor:
Slight acetic acid (vinegar) odor.
Solubility:
43g in 100g water.
Density:
1.74
pH:
No information found.
% Volatiles by volume @ 21C (70F):

0
Boiling Point:
Decomposes.
Melting Point:
237C (459F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Loses water of hydration above 100C.

Hazardous Decomposition Products:
Freshly-formed zinc oxide or zinc oxide fumes at high temperatures (over 800C).
Hazardous Polymerization:
Will not occur.
Incompatibilities:
No incompatibility data found. Oxidizing agents, zinc salts in general, alkalis and their carbonates, oxalates, phosphates, sulfides.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat: LD50: 2510 mg/kg. Reproductive effects cited. Mutation references cited.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Zinc Acetate (557-34-6)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved

waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Zinc Acetate (557-34-6)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Zinc Acetate (557-34-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Zinc Acetate (557-34-6)	No	No	No	Zinc compoun

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Zinc Acetate (557-34-6)	1000	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Solid)

Australian Hazchem Code: No information found.
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
Label Precautions:

Avoid contact with eyes, skin and clothing.
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No changes.

Disclaimer:

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